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**S.1. Conversion to metric system**

***Metric to English***

**Length**

1cm	= 0.394 inches
1 m	= 39.4 inches
1 m	= 3.28 feet
1 m	= 1.09 yards
1 km	= 0.621 miles

**Weight**

1 g	= 0.035 ounces
1 kg	= 2.2 pounds
1 ton	= 2200 pounds
1 ton	= 0.984 tons

**Surface**

1cm <sup>2</sup>	= 0.155 sq in
1 m <sup>2</sup>	= 10.76 sq ft
1 m <sup>2</sup>	= 1.2 sq yd
1 ha	= 2.47 acres
1 km <sup>2</sup>	= 247 acres
1 km <sup>2</sup>	= 0.386 sq miles

***English to Metric***

**Length**

1 inch	= 2.54 cm
1 foot	= 30.5 cm
1 foot	= 0.305 m
1 yard	= 0.914 m
1 mile	= 1.609 km

**Weight**

1 ounce	= 28.3 g
1 pound	= 454 g
1 pound	= 0.454 kg
1 ton (US)	= 1.02 tons

**Surface**

1 sq inch	= 6.45 cm <sup>2</sup>
1 sq foot	= 929 cm <sup>2</sup>
1 sq foot	= 0.093 m <sup>2</sup>
1 sq yard	= 0.836 m <sup>2</sup>
1 acre	= 0.405 ha
1 sq mile	= 2.59 km <sup>2</sup>

**Volume**

1 cm <sup>3</sup>	= 0.061 cu in
1 m <sup>3</sup>	= 35.3 cu ft
1 m <sup>3</sup>	= 1.31 cu yd
1 ml	= 0.035 fl. oz
1 l	= 1.76 pints
1 l	= 0.22 UK gal.
1 US gal.	= 0.833 UK gal.

**Volume**

1 cu inch	= 16.4 cm <sup>3</sup>
1 cu foot	= 0.028 m <sup>3</sup>
1 cu yard	= 0.765 m <sup>3</sup>
1 fl once	= 28.4 ml
1 pint	= 0.568 l
1 UK gal.	= 4.55 l
1 UK gal.	= 1.2 US gal.

**Temperature**

(Celsius x 1.8) + 32 = Fahrenheit

(Fahrenheit - 32) x 0.555 = Celsius

## S.2. Characteristics of radio and satellite communications

Type	Description
<b>Radio communication</b>	
VHF/UHF	Hand-held, mobile, or base units. Antenna size, transmission power, and terrain have effect on range – can vary from 1 to 30km, line-of-site. Range may be increased when used in conjunction with a repeater. Used for onsite coordination, personal security, and individual communications.
HF (shortwave)	Mobile and base stations. Range is dependent on frequency, time of day, and antenna in use. May be used for data transmission (2.4kbps). Used for regional / worldwide communications.
<b>Satellite communication</b>	
Thuraya (Thuraya*)	Handheld satellite phone with built-in GSM phone and GPS. Provides voice, fax and a 9.6kbps data service. Coverage area is north/central Africa, Europe, the Middle East, and Asia.
Iridium (Iridium)	Handheld satellite phone with voice, fax and a 2.4kbps data service. Worldwide coverage (polar areas included).
Mini-M (Inmarsat)	Satellite phone with voice, fax and a 2.4kbps data service. Notebook computer size. Worldwide coverage except polar areas.
GAN (Inmarsat)	Satellite phone with voice, fax and a 64kbps data service. Notebook computer size. Worldwide coverage except polar areas.
BGAN / Regional BGAN (Inmarsat*, Thuraya*)	Satellite data modem with speeds ranging from 144 to 492kbps over a shared channel. BGAN terminals include voice service. Notebook computer size. Inmarsat coverage area is Africa, Europe, the Middle East, Asia, parts of the Far East / Australia, and the Americas. See Thuraya for Thuraya coverage area.
V-SAT	Fixed satellite station for permanent / semi-permanent installation (large dish >1m). Data service from 32kbps (up) / 128kbps (down) and upwards. Can also provide voice service (IP telephony). Fixed monthly rate. Needs qualified technician for installation and service.
<b>Cellular communication</b>	
GSM	Global System for Mobile Communications. “Worldwide” cellular system with coverage in Europe, most Asian and African countries and in some countries in the Americas. The basic GSM data service speed is 9.6kbps with enhanced technologies providing speeds from 14.4kbps and upwards. Handsets are dual-band (900, 1800), tri-band (900, 1800, and 1900) or quad-band (900, 1800, 800, and 1900). Tri- and quad-band handsets are preferable since they have a larger global coverage area. GSM network operators must have roaming agreements with each other to enable the handset to function in foreign networks.
UMTS	Universal Mobile Telecommunications System. (Also commonly called 3GSM.) Designed to exceed the GSM standard. Data service with speeds up to 1920kbps.
CDMA/TDMA	Digital cellular systems used throughout the Americas and some parts of Asia. TDMA is slowly being replaced by CDMA/GSM systems.

\* Satellite coverage area is due to expand in the future.

### S.3. Characteristics of aircrafts that may be used during disaster operations

Aircraft type	Cruising Speed (knots)	Maximum cargo weight metric tons (2,200 lb)	Cargo hold size L x W x H (cm)	Door size W x H (cm)	Usable cargo volume m <sup>3</sup>	Pallet qty. 224 x 318 (cm)	Desired runway length (ft)
AN-12		15	1,300 x 350 x 250	310 x 240	100	n/a	n/a
AN-22		60	3,300 x 440 x 440	300 x 390	630	n/a	n/a
AN-26		5.5	1,060 x 230 x 170	200 x 160	50	n/a	n/a
AN-32		6.7	1,000 x 250 x 110	240 x 120	30	n/a	n/a
AN-72/74		10	1,000 x 210 x 220	240 x 150	45	n/a	n/a
AN-124	450	120	3,300 x 640 x 440	600 x 740	850	n/a	10,000
A300F4-100		40	3,300 x 450 x 250	360 x 260	320	20	8,200
A300F4-200		42	3,300 x 450 x 250	360 x 260	320	20	8,200
A310-200F		38	2,600 x 450 x 250	360 x 260	260	16	6,700
A310-300F		39	2,600 x 450 x 250	360 x 260	260	16	6,700
B727-100F		16	2,000 x 350 x 210	340 x 220	112	9	7,000
B737 200F		12	1,800 x 330 x 190	350 x 210	90	7	7,000
B737 300F		16	1,800 x 330 x 210	350 x 230	90	8	7,000
B747 100F		99	5,100 x 500 x 300	340 x 310	525	37	9,000
B747-200F	490	109	5,100 x 500 x 300	340 x 310	525	37	10,700
B747 400F		113	5,100 x 500 x 300	340 x 310	535	37	n/a
B757 200F		39	3,400 x 330 x 210	340 x 220	190	15	5,800
B767 300F		55	3,900 x 330 x 240	340 x 260	300	17	6,500
DC-10 10F		56	4,100 x 450 x 250	350 x 260	380	23	8,000
DC-10 30F		70	4,100 x 450 x 250	350 x 260	380	23	8,000
IL-76	430	40	2,500 x 330 x 340	330 x 550	180	n/a	2,800
L-100	275	22	1,780 x 310 x 260	300 x 280	120	6	n/a
L-100-20	275	20	1,780 x 310 x 260	300 x 280	120	6	n/a
L-100-30	280	23	1,780 x 310 x 260	300 x 280	120	6	n/a
MD-11F		90	3,800 x 500 x 250	350 x 260	365	26	n/a

Note: The cargo capacities and cruise speeds listed in the table are averages for that type of aircraft. Actual capacities will vary based on the altitude, ambient air temperature, and actual fuel on board.

#### S.4. Characteristics of helicopters that may be used in disaster operations

Helicopter type	Fuel type	Cruising speed (knots)	Typical allowable payload for hovering In ground effect (kg/lb) <sup>1</sup>	Typical allowable payload for hovering out of ground effect (kg/lb) <sup>2</sup>	Number of passenger seats
Aerospatiale SA 315B Lama	Jet	80	420/925	420/925	4
Aerospatiale SA-316B Allouette III	Jet	80	526/1,160	479/1,055	6
Aerospatiale SA 318C Allouette II	Jet	95	420/926	256/564	4
Aerospatiale AS-332L Super Puma	Jet	120	2,177/4,800	1,769/3,900	26
Bell 204B	Jet	120	599/1,20	417/920	11
Bell 206B-3 Jet Ranger	Jet	97	429/945	324/715	4
Bell 206L Long Ranger	Jet	110	522/1150	431/950	6
Bell 412 Huey	Jet	110	862/1900	862/1,900	13
Bell G-47	Aviation Gas	66	272/600	227/500	1
Bell 47 Soloy	Jet	75	354/780	318/700	2
Boeing H 47 Chinook	Jet	130	12,210/26,918	12,210/26,918	33
Eurocopter (MBB) BO-105 CB	Jet	110	635/1,400	445/980	4
Eurocopter BK-117A-4	Jet	120	599/1,320	417/920	11
MI-8	Jet	110	3,000/6,6139	3,000/6,6139	20–30
Sikorsky S-58T	Jet	90	1,486/3,275	1,168/2,575	12—18
Sikorsky S-61N	Jet	120	2,005/4,420	2,005/4,420	n/a
Sikorsky S-64 Skycrane	Jet	80	7,439/16,400	7,439/16,400	n/a
Sikorsky S-70 (UH-60) Black Hawk	Jet	145	2,404/5,300	1,814/4,000	14–17

<sup>1</sup> Use when takeoff and landing areas are relatively flat and load is non-jettisonable. Actual payload will vary based on elevation and temperature, amount of fuel, and other factors.

<sup>2</sup> Use for sling load missions (cargo is placed in a net or suspended from a line and picked up and moved by the helicopter using a belly hook), and adverse terrain (landing areas on top of steep ridges or adjacent to cliffs) or weather. Actual payload will vary based on elevation and temperature, amount of fuel, and other factors.

## S.5. Aircraft loading and offloading methods

Aircraft may be loaded in four ways:

- **Bulk Loaded** -Cargo is loaded on the floor and held in place by nets, straps, or ropes. This may increase the usable cargo space on an aircraft; however, securing cargo in place may be more difficult. Bulk loading also slows loading and offloading, sorting, distribution, and customs processing.
- **Palletized** - Cargo is preloaded onto pallets; held in place by nets, straps, or ropes; and then loaded onto the aircraft. This method is often used to move OFDA commodities. OFDA usually uses DOD (U.S. Department of Defense Air Force) aircraft for short time-frame-disaster support, and the DOD's preferred method of cargo packaging is using pallets and netting. Commercial aircraft also use pallets. Military pallets, officially called dual rail 463L pallets (nicknamed "cookie sheets"), measure 88 x 108 inches, are made of aluminium, and weigh 356 pounds. The loaded pallets range from 2,000 to 6,000 pounds. These pallets are reusable and must be returned. Do not leave them! They are used on the CB5s, CB17s, CB141s, CB130s, and some commercial aircraft. For logistical planning purposes, when building pallets, limit the height of a stack to 96 inches for these aircraft unless authorized to stack higher by the crew chief. The size of commercial pallets varies, but is most often 88 x 108 inches or 88 x 125 inches. They are used on DCB8s, BB727s, DCB10s, and BB747s and weigh over 300 pounds. These pallets are also reusable. Commercial Hercules also use a pallet that is 88 x 118 inches. It is possible to build up pallets on the aircraft, but it is more difficult and very time-consuming. Remember, flight crew duty time is ticking!
- **Containerized** - Cargo is preloaded into closed containers and then loaded onto the aircraft. This method is used to load large commercial aircraft such as 747s and DCB10s. Cargo containers come in a great variety of shapes and sizes and their maximum loaded weights range from less than 1,000 pounds to 25,000 pounds. Each type is designed to be loaded and offloaded with cargo in place using a mechanized loading system or a forklift. Containerizing is very difficult and time-consuming, and sometimes it is impossible to hand-load or unload containers once they are on the aircraft. If a forklift will be used to load or offload containers or pallets, make sure that the forklift can carry the largest pallet, has tines long enough to counterbalance the weight, and that the highest point of the forklift is lower than that portion of the aircraft (wing, tail, or door in open position) where it must move to retrieve the container or pallet.
- **External (helicopters only)** - Cargo is placed in a net or suspended from a line and picked up and moved by the helicopter using a belly hook. Helicopters normally lift and move more cargo externally (slinging) than internally. The external cargo is loaded into specially made nets that are connected to a cargo hook on the belly of the helicopter. Cargo may also be suspended on cables (lead lines). Make sure lead lines and nets are approved for slinging cargo.

Pallets, containers, nets, and lead lines are reusable. They may also need to be returned quickly to their point of origin so they can be used for loading more cargo. Always think in terms of "back hauling" cargo equipment for reuse or when it is no longer needed.

## S.6. Acronyms list

The following table represent some of the most commonly used acronyms in the in this book, but not all are included. However, acronyms are written with its full name the first time it's mentioned in a chapter.

<b>Acronym</b>	<b>Full name</b>
APHP	Asia-Pacific Humanitarian Partnership
ASC	Area Security Coordinator (UN DSS)
CAP	Consolidated Appeals Process
CERF	Central Emergency Response Fund
CMcoord	Civil Military Coordination
CMCS	Civil Military Coordination Section (OCHA)
CMOC	Civil-Military Operations Centre
CRD	Coordination and Response Division (OCHA)
CSA	Chief Security Advisor (UN DSS)
DART	Disaster Assistance Response Team (US)
DCPEP	Directorate of Civil Protection and Emergency Planning (Norway)
DEMA	Danish Emergency Management Agency (Denmark)
DFID	Department for International Development (United Kingdom)
DO	Designated Official (for UN security in-country)
DSA	Daily Subsistence Allowance
ECHO	European Commission Humanitarian Aid Office (European Union)
ERC	UN Emergency Relief Coordinator
ESB	Emergency Services Branch (OCHA)
EU	European Union
FACT	Field Assessment and Coordination Team (IFRC)
FAO	Food and Agricultural Organisation (UN)
FCSS	Field Coordination Support Section (OCHA)
FIS	Field Information Section (OCHA)
FRF	Finn Rescue Force (Finland)
FSCO	Field Security Coordination Officer (UN DSS)
GA	UN General Assembly
GDACS	Global Disaster Alert and Coordination System
HAZMAT	Hazardous Materials
HIC	Humanitarian Information Centre (OCHA)
IASC	Inter-Agency Standing Committee
ICRC	International Committee of the Red Cross
ICT	Information and Communication Technology
ICVA	International Council of Voluntary Agencies
IFRC	International Federation of Red Cross and Red Crescent Societies
IHP	International Humanitarian Partnership
INSARAG	International Search and Rescue Advisory Group
LEMA	Local Emergency Management Authority
MCDA	Military Civil Defence Assets
NGO	Non-Governmental Organization
OCHA	UN Office for the Coordination of Humanitarian Affairs

<b>Acronym</b>	<b>Full name</b>
OFDA	Office of US Foreign Assistance Assistance (USA)
OHCHR	United Nations High Commissioner for Human Rights
OSOCC	On-Site Operations Coordination Centre
PoA	Plan of Action
RC/HC	UN Resident Coordinator/Humanitarian Coordinator
SMT	Security Management Team (for UN in-country)
SRSA	Swedish Rescue Services Agency (Sweden)
SRSR	Special Representative of the Secretary-General
ToR	Terms of Reference
UN DSS	United Nations Department of Safety and Security
UNCT	United Nations Country Team
UNDAC	United Nations Disaster Assessment and Coordination (OCHA)
UN DMT	United Nations Disaster Management Team
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFPA	United Nations Population Fund
UNHAS	United Nations Humanitarian Air Service
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNJLC	United Nations Joint Logistics Centre
UNOG	United Nations Office in Geneva
USAR	Urban Search and Rescue
USG	Under Secretary General
WFP	World Food Programme
WHO	World Health Organization